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ABSTRACT

Two experiments were conducted to determine whether the connective structure of a passage might protect interrelated information from interference by irrevelant information in sentence recognition. Subjects of both experiments were college students enrolled in introductory psychology classes. In each, a rating task for unconnected phrases was interpolated between an incidental processing task for sentences and a forced choice recognition task. Phrases were designed to interfere with either the exact wording or the specific meaning of sentences, yet to be unrelated to the unifying theme. Interference on each level was obtained in memory for a list of thematically unrelated sentences, but not in memory for passage sentences, except under conditions in which the phrase pairs were explicitly related to the passage. These results seem to confirm the facilitative role of passage structure. (Appendixes include test sentences and graphs of results.) (Author/JL)

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Interference in Sentence Memory

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Running Head: Isolation or Interference

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Interference in Sentence Memory

Interrelated information is often remembered better than unrelated information. This observation holds for individual words (Cofer, 1967) as well as for sentences (Hayes-Roth & Thorndyke, 1979; Kintsch, 1974; Meyers & Boldrick, 1975; Moeser, 1979; Yekovich & Manelis, 1980). Theoretical accounts typically attribute the advantage of interrelated information to integrative processes that occur as the information is stored. When sentences occurring somewhat contiguously contain identical or associated lexical units, they are represented in memory as a structure of connections supplied by shared concepts. These connections facilitate retrieval and are thus assumed to be responsible for the relative advantage in recall of interrelated sentences (cf. Yekovich & Manelis, 1980). It seems reasonable to suggest, however, that integrative processes might not only connect representations of sentences, but also isolate these representations from information unrelated to their specific integrative themes. In this light, the interrelated information presented in a prose passage could well be protected from interference by irrelevant information.

The present research was designed to determine whether the connective structure of a passage might perform such a protective function in sentence recognition. The reasoning behind this idea is straightforward. The representational context for words or concepts from a passage consists of a structure of interrelationships, some of them denoting propositions expressed by sentences, some of them connecting propositions across the syntactic boundaries established by sentences and providing thematic coherence (Black & Bower, 1979). This structure itself can be referred to as passage theme. Passage theme, as an important extension of the context beyond the individual sentence, differentiates the word or concept from similar words and concepts occurring outside the passage and unrelated to its

theme. Thus, sentence information may be isolated[1] by the theme-supplied context of the passage. This isolation potentially benefits recognition accuracy.

To illustrate the isolation effect, consider the contents of a potentially confusing chapter on memory in an introductory text. If the chapter is clearly organized and the concepts can be processed in an interrelated fashion, then assertions regarding the memory system should not be confused with similar notions in other chapters of the text. If, however, the chapter is obtusely organized and processed as a set of disconnected facts, a novice may later declare having read that deep processing reaches the unconscious and retrieval is impaired by repression and sublimation.

The isolation account of superior memory for interrelated sentences specifies that interference in sentence memory should be obtained under certain conditions but not under other conditions. First, a group of sentences lacking a connective structure, because of intent or organizational poverty, is a prime candidate for interference from materials with similar meaning. Although the literature contains no direct evidence of experimentally induced interference in memory for a list of unrelated sentences, a similar effect is illustrated by early findings of integrated memory (Bransford & Franks, 1971). Within the context of unrelated idea sets, remembering the specific syntax of target sentences was made difficult by later occurring sentences with similar meaning but different syntactic arrangements. In fact, Bransford & Franks' results have been interpreted as indicating surface-structure interference (James & Hillinger, 1977).

A second major source of interference in sentence memory exists in information that is thematically or structurally related to passage sentences. In this case, sentence information is stored within a connective structure. Yet additional information presented as relevant to the passage is incorporated within the structure, providing interference at retrieval. Multiple sources of interference

in passage memory have been identified. Additional information directly related to the passage gist as outcome information (Hertel, 1982; Hertel, Cosden, & Johnson, 1980; Snyder & Uranowitz, 1978; Spiro, 1980), other passages with similar topics or structures (Bower, 1974; Crouse, 1971; Thorndyke & Hayes-Roth, 1979), and analogies to prior knowledge (Dooling & Christiaansen, 1977a, Schustak & Anderson, 1979) all produce errors based on sources external to the passage. Interference of these types can be attributed to the same processes that are responsible for the original representational structures. These structures are expanded, they contain multiple instantiations that are episodically coded, or the boundaries denoting specific episodes of related facts blur (cf. Thorndyke & Hayes-Roth, 1979).

For example, assume that a chapter on Freud occurs toward the end of the introductory text, and the author of the chapter interprets some aspects of psychoanalytic theory from within a memory-system framework. Under these conditions, errors in confusing repression with "other" memory processes would not be surprising, regardless of the degree of integration of information presented in the earlier memory chapter.

A final sources of interference in memory for passage sentences is established within the passage itself. Intra-passage interference should obtain to the extent that propositions are repeated but expressed by different surface structures or instantiated with different lexical units. However, these occurrences are more typically viewed as integrative processes in prose acquisition. In sensible discourse if propositions are differentially repeated, the concepts are typically preserved. In this case, interference in memory for exact wording is the only issue. Here again, the Bransford and Franks data are relevant, as well as Sachs' (1967) demonstration of better memory for sentence meaning than for sentence syntax. Yet to the extent that passage propositions are not differ-

entially repeated, superior memory results from a high degree of integration (cf. Kintsch, 1974; Reder & Anderson, 1980). Memory for such sentences should withstand the presentation of similar information in irrelevant contexts and show less interference than memory for unrelated sentences.

The following experiments were designed to test predictions from the isolation account regarding retroactive interference effects in recognition memory. In the first experiment, the processing of either passage or unrelated sentences was followed by a passage-irrelevant task, containing materials which nevertheless were similar in meaning to portions of the previous sentences. Interference was expected in memory for the unrelated sentences only. In Experiment 2, passage sentences were followed by an irrelevant or relevant interpolated task; interference in passage memory was predicted for the latter condition alone.

Experiment 1

Method

Subjects and design. A total of 192 volunteers from introductory psychology classes participated in the mixed design; 32 subjects served in each combination of interpolated list (verbatim, semantic, or control) and sentence type (unrelated or passage). The within-subject factor was distractor type (verbatim or semantic). Subjects participated individually or in pairs. Individuals or pairs were randomly assigned to conditions of sentence and interpolated lists, subject to an equal n constraint, and individuals were systematically assigned to recognition lists.

Materials. For the first task a list of passage sentences and a list of unrelated sentences were constructed, the latter by substituting various proper nouns for the main characters of the passage, changing other nouns to "unrelate" the sentences, and randomizing sentence order. Individual sentence structures were maintained. (Both lists are presented in the Appendix.)

As indicated in Table 1, phrase pairs for the interpolated task were constructed to interfere with memory for either the exact wording or the meaning of sentences, or to have no particular effect on sentence memory. Phrase pairs were not directly related to target gist ("over half the time" versus "most of her life"). However, the phrase pairs always contained lexical or conceptual information included in distractors for the forced-choice recognition test. Therefore, possibly competing information was provided during the interpolated task, in the sense that distractors and phrase pairs shared some information.

The interpolated task consisted of 22 phrase pairs. In the control condition, all 22 pairs were completely unrelated to the previous sentences . In the verbatim condition, 15 pairs were constructed to interfere with verbatim memory for the corresponding sentence list, using selected words which later appeared in the verbatim distractors. In the semantic condition, 15 pairs were designed to affect semantic memory of their corresponding sentence lists; these pairs employed words or synonyms of words appearing in semantic distractors. The 15 interfering pairs always appeared in Positions 3 - 5, 7 - 9, 11 - 13, 15 - 17, and 19 - 21, in the same order as the sentences with which they were designed to interfere. The remaining positions were filled with 7 neutral phrases from the control list, to mask the nature of the interpolated task.

Distractor sentences for the recognition test were constructed from sentence similarity ratings made by 21 introductory psychology students. For the rating task, each of the unrelated sentences was typed on a page, with a portion of the sentence underlined, and six new phrases typed below. The raters' task was to judge the similarity in meaning of the original sentence to sentences constructed by substituting each of the new phrases for the underlined portion. A rating scale at the top of the page ranged from 1 (highly dissimilar) to 9 (highly similar). New sentences which received the highest median ratings (7 or greater)

were chosen as verbatim distractors for the list of unrelated sentences. Those receiving the lowest ratings (4 or less) were chosen as semantic distractors. These verbatim and semantic distractors were then modified to serve as distractors for passage sentences. Examples are provided in Table 1.

The nature of the distractors and the interpolated phrases has been dichotomized (verbatim versus semantic), yet it should be noted that the distractors reflect continua of semantic similarity to target sentences. Verbatim distractors preserved the meaning of the original sentences and were intended to reflect interference in memory for exact wording. Semantic distractors contained changes in meaning but preserved the dimension upon which the meaning was based. For example, "all of her life" differs semantically from "most of her life" but the dimension of time is preserved.

Four recognition lists were constructed for each of the two sentence lists; each list contained 15 target/distractor pairs, arranged on one sheet of paper. Item order always duplicated the order of input sentences. The order of distractor position (above or below the target) was randomly chosen for two lists, with an equal n constraint, and reversed for the remaining two. Each of the four lists contained both verbatim and semantic distractors, with type of distractor alternating across items. Two lists began with verbatim distractors for Item 1, whereas the other two began with semantic distractors. Therefore, across lists each target was paired equally often with each distractor type and occurred equally often in each position in the pair.

Procedure. Subjects were told initially that the experimenter intended to collect some rating data to be used in constructing materials for later experiments. In this regard, the first task required interest ratings for 15 sentences. Subjects were instructed to make their ratings by considering each sentence within the hypothetical context of conversation with a friend. A rating

scale numbered from 1 (no interest) to 5 (great interest) was provided and described. For the passage condition these instructions were modified to encourage passage processing. Subjects were asked to judge their interest in the story as it unfolded, sentence by sentence. The first rating obviously would reflect interest in just the first sentence, the second rating in the first two sentences together. Thus, the 15th rating presumably would reflect interest in the entire story. Following an invitation for questions, slides of the 15 unrelated or passage sentences were projected for 6 seconds each, with a 4-second interval allowed for ratings.

The second task, according to the ruse, involved rating phrase pairs ostensibly to be used in another experiment. Subjects were told to expect 22 pairs of phrases, presented one pair at a time, and to compare the two phrases along a dimension of semantic similarity. A five-point scale for interphrase similarity was described and illustrated at the top of the response sheet. Slides were presented at a 6-second exposure rate with a 6-second interval for ratings.

The third and last task was described as a pilot for a memory experiment. Subjects were instructed to choose within each pair of sentences on the recognition list, the sentence that had been presented in the first task. The test was self-paced and, upon completion, subjects were debriefed and dismissed.

Results and Discussion

Figure 1 depicts the mean number of recognition errors in choosing verbatim

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Insert Figure 1 about here

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or semantic distrators for each combination of sentence type with interpolated list. (Either seven or eight errors were possible for each distractor type.) For all analyses, alpha was set at .05.

Verbatim errors. The left panel of Figure 1 suggests that interference in memory for exact wording was stronger following unrelated sentences than passage sentences. This difference was supported by a reliable interaction of sentence type with a comparison of verbatim with control interpolated lists, F (1,186) = 5.73, MS_e = 1.32. Furthermore, the verbatim interpolated list reliably led to more errors than did the control phrases for unrelated sentences only, F (1,186) = 18.94. This effect held for 12 of the 15 recognition items.

Additional analyses were performed, following the suggestions of Clayton and Warren (1976) for analyzing results from similar designs. These authors advise direct comparisons of input conditions within conditions of interpolated activity, followed by some assurance of a constant degree of original learning. In this regard, the difference between sentence types was reliable for subjects who saw phrases designed to interfere with verbatim memory, F (1,186) = 4.73. (The direction of this difference remained constant across 10 of the 15 items.) Furthermore, we can assume that the degree of original learning for verbatim aspects of unrelated sentences is similar to that for passage sentences, given the obvious lack of a difference in verbatim errors between the control groups.

Semantic errors. The right panel of Figure 1 indicates that the overall number of semantic errors was relatively small. The only reliable effect of interest was an interference effect (semantic versus control) in memory for the meaning of unrelated sentences, F (1,186) = 9.30, MS_e = .81. Again, a majority of the items (eight) showed the effect; four showed no difference. The lack of a comparable effect in memory for passage sentences is somewhat uninterpretable, given the similar number of errors in the semantic conditions of interpolated list for the two sentence types (unrelated versus passage) and the apparent, although unreliable, difference between the two control conditions. Spurious differences in original learning are at least suggested.

Experiment 2

The results of Experiment 1 revealed important memorial differences between unrelated and passage sentences. Phrase pairs unrelated to passage gist interfered with memory for the exact wording of unrelated sentences, yet identically constructed passage sentences were not reliably affected. Despite the high level of semantic accuracy in general and a tendency toward differences in original learning, interference in memory for meaning was suggested. These results, then, are consistent with evidence for the retention of lexical information in passages (Yekovich & Thorndyke, 1981) and conform to predictions based on the isolated nature of integrated memory representations. However, since this interpretation relies in part upon the lack of an effect in passage memory, a more complete test of the integration view would include a manipulation of the conditions under which interference in passage memory can be obtained.

It has been clear for quite some time (cf. Underwood, 1945) that interference increases with the degree of similarity between original and interpolated materials and loss of discriminability. With regard to passage memory, similarity between passage and interpolated materials can be varied by manipulating the number of shared concepts or predicates (Thorndyke & Hayes-Roth, 1979). Discriminability, often conceived in temporal terms, possibly depends upon the instructions for processing the original and intervening materials. Instructions to compare the two sets should reduce the episodic distinctiveness of each and increase the likelihood that information in phrases would serve as competing instantiations of slots within the passage structure.

In Experiment 2, instructions and materials for the interpolated task were varied along a dimension of relatedness to passage sentences. In the interphrase condition, instructions and phrases were identical to those in Experiment 1. In the intertask condition, subjects were asked to relate each phrase pair to the

passage and to judge the degree of similarity between the phrase pair and passage information. In addition, phrases were modified to directly pertain to passage information. These changes in instructions and materials in the intertask condition were expected to encourage subjects to incorporate phrase information, when appropriate, within the passage structure activated by the task. Therefore, interference under intertask but not interphrase conditions was predicted.

Method

Materials. Two additional lists of phrase pairs were prepared for intertask conditions. For both verbatim and semantic interpolated lists, the original pairs were modified by including elements of passage sentences with which they were designed to interfere. To illustrate, in the verbatim condition the first phrase pair in Table 1 was changed to "overhalf her life/ most of her life." The semantic pair became "all of her life/ since she was born." Thus, one phrase in the pair provided a possible second instantiation of a portion of the proposition represented by the first sentence. Under intertask conditions every phrase pair included phrases which were repeated later in distractor sentences and this occurred to a greater extent than under interphrase conditions. For example, on the recognition test the target sentence, "Donna quit work to take care of her children," was paired with "Donna quit work to raise her children" (verbatim distractor) or with "Donna quit work to enjoy her children" (semantic distractor). The corresponding phrase pairs used in Experiment 1 and under interphrase conditions of Experiment 2 were: "tend to the pets/ raise animals" (verbatim interpolated list) or "appreciate the chance/ enjoy the opportunity" (semantic interpolated list). To facitilate intertask processing, intertask conditions in Experiment 2 saw instead: "tend to her children/ raise her children" (verbatim interpolated list) or "appreciate her children/ enjoy her children" (semantic interpolated list).

Subjects, design, and procedure. Each of 96 volunteers from additional introductory psychology classes participated in one of six conditions. Interpolated list (verbatim, semantic, or control) was crossed with phrase type (interphrase or intertask). Everyone viewed and rated passage sentences. Interphrase conditions received the original instructions for the interpolated task and were shown the phrase pairs from Experiment 1. Intertask conditions received instructions to relate phrases to previously presented sentences and and saw the modified phrase pairs described above. These intertask instructions asked subjects to:

> (T)ry to recall the previous sentences while viewing the phrase pairs. Keep in mind the possibility that each pair of phrases might be similar to a previous sentence. If you believe that a phrase pair either means the same or uses the same words as a portion of a previous sentence, give it a high similarity rating. Use the range of ratings to stand for varying degrees of similarity of phrase pairs to previous sentences.

In all other respects the procedures duplicated those in Experiment 1.

Results and Discussion

Verbatim errors. In the left panel of Figure 2 the mean number of errors

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Insert Figure 2 about here

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in choosing verbatim distractors is presented for each condition of interpolated list and phrase type. Although the interaction of interpolated list with phrase type was not reliable, the verbatim interpolated list clearly led to more errors than did the control list for the intertask condition of phrase type, F (1, 90) = 6.88, MS = 1.47. This effect held for 10 of the 15 items, with 3 items showing no difference. As in Experiment 1, the interference effect in memory for passage wording was not reliable under interphrase conditions.

The difference between phrase types within the verbatim interpolated-list condition (2.37 versus 2.69) was not reliable. Although the difference between phrase type conditions within the control interpolated-list condition (1.94 versus 1.56) was also not reliable, it suggests that either a chance elevation in errors in the interphrase conditions or possible differences in original learning might contribute to the lack of a reliable difference between verbatim interpolated-list conditions.

Semantic errors. The mean number of semantic errors for each condition is presented to the right in Figure 2. Reliable interference effects (semantic versus control) in memory for sentence meaning occurred only for the intertask condition of phrase type, F (1,90) = 10.71, MS_e = .84. Eleven items showed the effect, two items showed no difference. In addition, the reliably fewer number of semantic errors in the interphrase condition than in the intertask condition for those subjects seeing the semantic interpolated list (1.00 versus 1.88) provides even stronger evidence of differential interference, F (1,90) = 7.27. Nine items showed this effect; four showed no difference.

General Discussion

In summary, the results of these experiments demonstrate that passage memory is less affected by interpolated materials unrelated to passage theme than is memory for unrelated sentences. In Experiment 1, when interpolated information followed a list of unrelated sentences that were structurally identical to passage sentences, retroactive interference was obtained in memory for the exact wording of the unrelated sentences. Under identical conditions, these materials did not reliably interfere with passage memory. A similar effect occurred in memory for the meaning of unrelated sentences, compared to passage sentences. Yet this effect must be viewed with more caution, given a tendency toward differences in original learning. Nevertheless, none of the conditions in either experiment

produced any evidence for interference in passage memory by information irrelevant to its theme. Theoretically, these results fit neatly within the integration framework and the postulated isolation function of passage structure. However, two alternative accounts deserve to be mentioned.

Rather than indicating the incorporation of phrase information into passage memory, the intertask results of Experiment 2 might simply reflect failure to retrieve accurate episodic information regarding targets and distractors. Because distractors were so similar to the intervening phrases, subjects may have confused phrase information and original sentence information at the time of the test. Yet, the finding that makes an episodic confusion account less viable is that the largest interference effects in this report were obtained under conditions in which the phrase context for the distractor information was dissimilar to the distractor context (unrelated sentences in Experiment 1). Such dissimilarity should have facilitated retrieval on an episodic basis, but apparently did not. Moreover, the interphrase interpolated materials used in Experiment 1 were no more similar to distractors for unrelated sentences than to passage distractors. Thus, an episodic confusion account insufficiently describes both sets of findings. (For a discussion of episodic confusion within integrated structures, see Thorndyke & Hayes-Roth, 1979.)

Another retrieval interpretation of these results can be made from within the multiple-representation view of passage memory (Dooling & Christiaansen, 1977b; Sach, 1974). Within this framework, passage information is stored on various levels, depending on the nature of the processing task. Typically, representations of passage theme or gist, individual sentence meaning, syntactic information, and lexical elements all occur, each with its associated strength. Thematic representations persist longest, followed by representations of specific meaning, and then lexical and syntactic codes. To account for the present data, the

multiple-representation view must first assume that subjects use a thematic retrieval strategy in recognition testing. Then, it must be assumed that thematic codes guide retrieval of specific details from the passage while avoiding interpolated information, except when the interpolated information is contextually similar to target information (Experiment 2). In the latter case, the target information is somehow rejected during the retrieval process, in favor of the more recently acquired but less thematically relevant words and concepts from interpolated phrases. This account is awkward, particularly regarding the need to propose that one code must be employed to retrieve other codes during recognition.

The integration framework provides a clearer and more parsimonious view of these results. From this perspective, passage information is stored as a network of propositional relations instantiated by lexical information. This structure isolates its contents from irrelevant information and incorporates relevant information, through relational processing and stimulus manipulation. In this manner, the structure functions to unify its contents into a holistic representation; it supplies the missing element in the gestalt inequality: the whole is greater than the sum of its parts (cf. Goetz, Anderson, & Shallert, 1981).

From a story-memory perspective, the structure of a passage provides coherence among the substructures (Black & Bern, 1981; Black & Bower, 1979). When the passage has narrative form and function (as in these experiments), the structure provides connections among the separate episodes or events in the story. These connections may express causal relations among story events or they may take the form of a stereotyped pattern of associated events. The passage used in these experiments, for example, describes the traditional-wife story, a story that always includes some elements of a standard set of events, such as putting the husband through school, raising the kids, and decorating the house. Black (personal communication) has suggested that representations of narratives with more

causal coherence might be more resistant to interference than would narratives with more losely organized connections. Similarly, the degree of thematic coherence of the type described above might also predict interference effects. These are interesting topics for future research.

Finally, perhaps the broadest context for this report is the emerging realization that the integration framework can organize somewhat disparate findings concerning retroactive interference effects and, more generally, conditions of accuracy or error in passage memory (cf. Spiro, 1980; Thorndyke & Hayes-Roth, 1979). In Experiment 1, passage theme or structure provided greater accuracy, not an uncommon function in passage recall and recognition. This time, however, greater accuracy resulted from the protection from thematically irrelevant activities that the structure provided. In contrast, an overall impression gained from evidence concerning thematically relevant activities is that integrated structures encourage inaccuracy, by serving as links between passage information and sources of interference. Similarly, intertask conditions of Experiment 2 resulted in interference, although possibly not to the extent that might result from information more directly related to the theme (cf. Bower, 1974; Reder & Anderson, 1980).

This relationship between error/accuracy and passage relevance appeals to our intuitions regarding the conditions for obtaining interference. Not only can we imagine how relevant information might change our memory for an event, but also how the well-integrated nature of some materials, such as overlearned poems or speeches, might resist interference from other surface or lexical expressions of the ideas they impart.

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Appendix

Materials for Task 1

Passage Sentences

1. Donna Madison has lived in Albuquerque for most of her life.
2. Ten years ago, Donna married Charles Madison, a sociable businessman.
3. Donna met Charles in college when she was a junior and he was a graduate student.
4. Charles was an average student, but he had strong goals for his future.
5. Donna was a very bright person, but lacked a clear direction in her studies.
6. She was certain she was in love and decided to get married.
7. After her wedding, she got a job as a secretary in the psychology department.
8. Donna worked until Charles finished his degree and she gradually developed an interest in psychology.
9. She thought it would help her understand herself and others better.
10. Donna quit work to have her first baby and has stayed home to take care of her children.
11. They now have two boys and a girl, all under the age of seven.
12. They live in a charming old house, which they have renovated on weekends.
13. Donna has taken decorating courses and knows a lot about primitive furniture.
14. She is an excellent hostess and provides a calm and well-organized atmosphere.
15. Donna is basically content with her life.

Unrelated Sentences

1. Betty Harrison has lived in Europe for most of her life.
2. The woman was certain that she was in love and decided to get married.
3. Phyllis met Dan in college when she was a junior and he was a graduate student.
4. Ed has taken decorating courses and knows a lot about primitive furniture.

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4. Charles was an average student, but he had strong goals for his future.
5. Donna was a very bright person, but lacked a clear direction in her studies.
6. She was certain she was in love and decided to get married.
7. After her wedding, she got a job as a secretary in the psychology department.
8. Donna worked until Charles finished his degree and she gradually developed an interest in psychology.
9. She thought it would help her understand herself and others better.
10. Donna quit work to have her first baby and has stayed home to take care of her children.
11. They now have two boys and a girl, all under the age of seven.
12. They live in a charming old house, which they have renovated on weekends.
13. Donna has taken decorating courses and knows a lot about primitive furniture.
14. She is an excellent hostess and provides a calm and well-organized atmosphere.
15. Donna is basically content with her life.

Unrelated Sentences

1. Betty Harrison has lived in Europe for most of her life.
2. The woman was certain that she was in love and decided to get married.
3. Phyllis met Dan in college when she was a junior and he was a graduate student.
4. Ed has taken decorating courses and knows a lot about primitive furniture.

5. Jane is an excellent hostess and provides a calm and well-organized atmosphere.
6. Doris thought therapy would help her understand herself and others better.
7. Sue quit work to have her first baby and has stayed home to take care of her children.
8. Marie lives in a charming old house which she has renovated on weekends.
9. After her father died, Sharon got a job as a secretary at City Hall.
10. He made dinner until Janice finished her degree and he gradually developed an interest in cooking.
11. Ten years ago, Tony married Sue Bennett, a sociable businesswoman.
12. Mary was a very bright person, but lacked a clear direction in her studies.
13. The two old people have two cats and a dog, all under the age of seven.
14. Donna is basically content with her life.
15. Bob was an average worker, but he had strong goals for his son.

Table 1

Examples of Materials for the Sentence, Interpolated Phrase, and Recognition Tasks

Task 1: Sentences

Unrelated Condition

Betty Harrison has lived in Europe for most of her life. (1)

Sue quit work to have her first baby and has stayed home to take care of her children. (7)

Passage Condition

Donna Madison has lived in Albuquerque for most of her life. (1)

Donna quit work to have her first baby and has stayed home to take care of her children. (10)

Task 2: Phrase Pairs

Verbatim Condition

over half the time
a long time

tend to the pets
raise animals

Semantic Condition

all the time
since birth

appreciate the chance
enjoy the opportunity

Control Condition

the brick ediface
the stone building

nibble on the candy
snack on the treats

Task 3: Recognition Pairs

Verbatim Distractor: Unrelated

Betty Harrison has lived in Europe for most of her life. (T)
Betty Harrison has lived in Europe over half of her life. (D)

Verbatim Distractor: Passage

Donna quit work to have her first baby and has stayed home to raise her children. (D)
Donna quit work to have her first baby and has stayed home to take care of her children. (T)

Semantic Distractor: Unrelated

Sue quit work to have her first baby and has stayed home to enjoy her children. (D)
Sue quit work to have her first baby and has stayed home to take care of her children. (T)

Semantic Distractor: Passage

Donna Madison has lived in Albuquerque for most of her life. (T)
Donna Madison has lived in Albuquerque for all of her life. (D)

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Note. In the first column numbers in parentheses refer to the position on the sentence list. In the last column letters in parentheses refer to target (T) and distractor (D).

Figure Captions

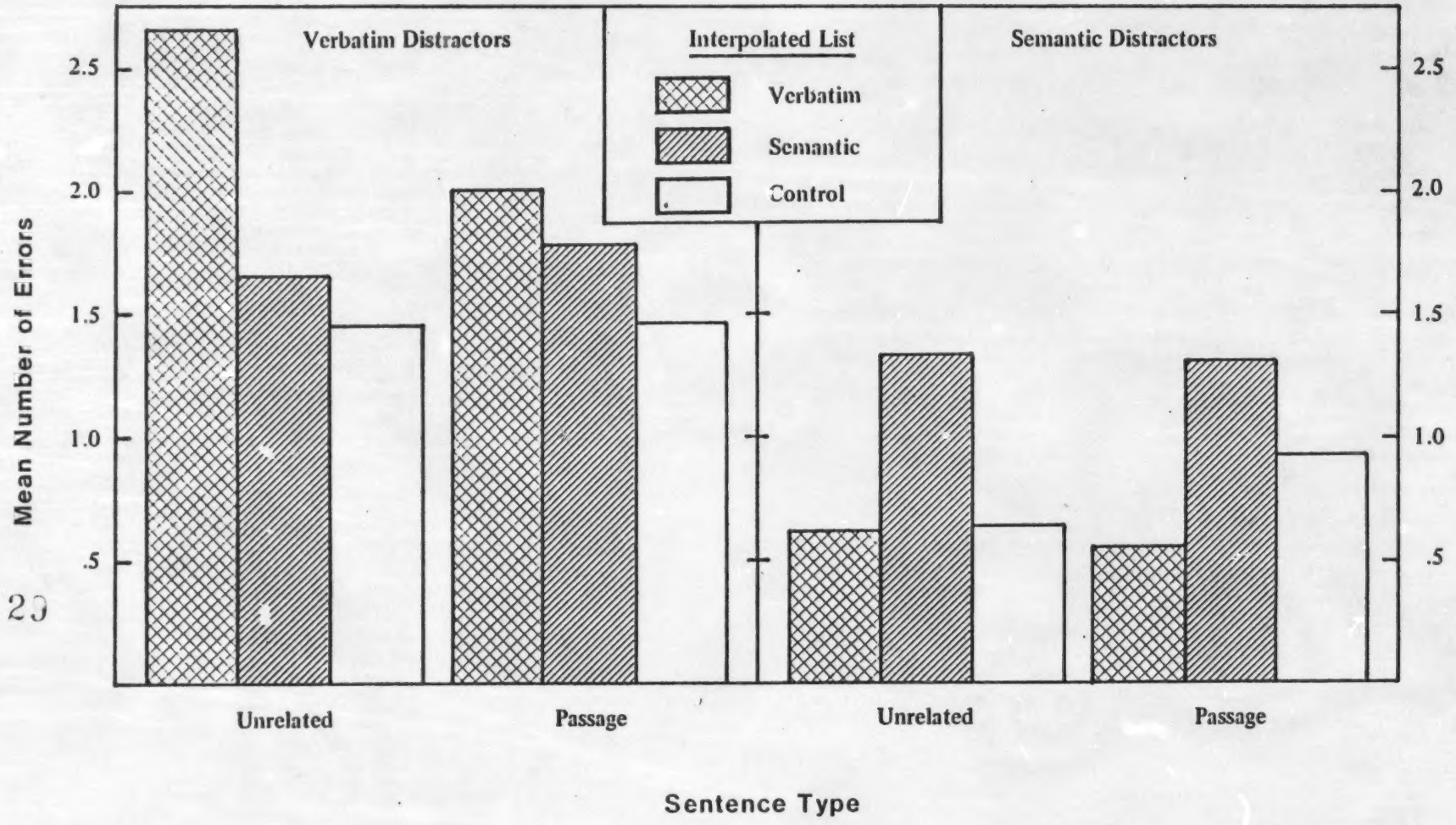
Figure 1. Mean number of verbatim (left panel) and semantic (right panel) errors from each condition of sentence type and interpolated list (Experiment 1).

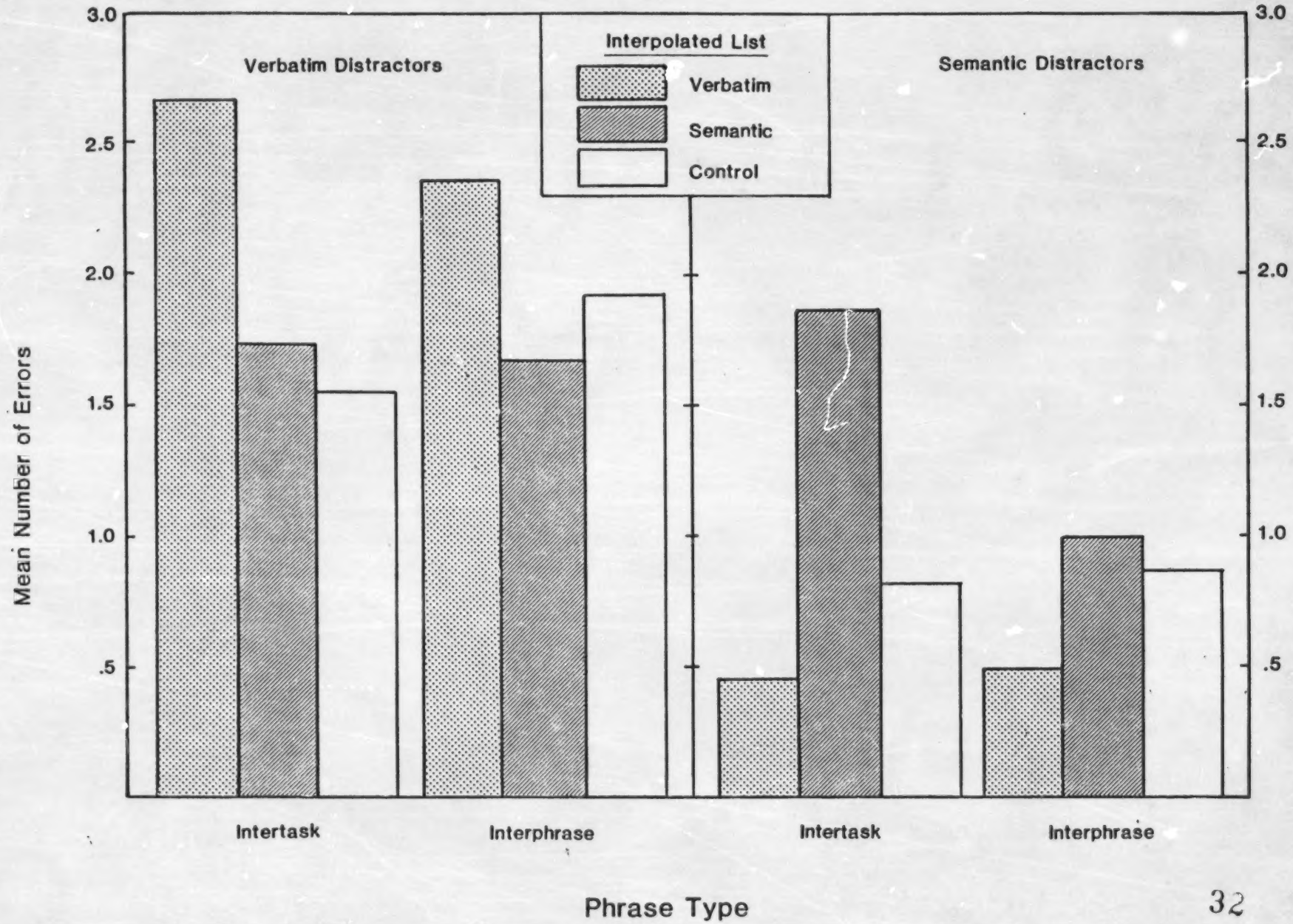
Figure 2. Mean number of errors in passage recognition from each condition of distractor type, phrase type, and interpolated list (Experiment 2).

Footnotes

*I thank Reed Hunt and Dan Wegner for comments on an earlier version of this manuscript and Michael Piette and Nancy Thompson, who assisted in the collection of data. These data were discussed in a paper presented at the annual meeting of the Rocky Mountain Psychological Association, Albuquerque, New Mexico, May 1, 1982. Requests for reprints should be sent to Paula Hertel, Department of Psychology, Trinity University, 715 Stadium Drive, San Antonio, TX 78284.

[1]The term isolation, it should be noted, is consistent with the general spatial metaphor that characterizes memory research (cf. Roediger, 1980).


Verbatim Distractors
Interpolated List
Semantic Distractors
Verbatim
Semantic
Control
Mean Number of Errors
2.5
2.0
1.5
1.0
.5
Unrelated
Passage
Unrelated
Passage
Sentence Type


Verbatim Distractors
Semantic Distractors
Interpolated List
Verbatim
Semantic
Control
Mean Number of Errors
3.0
2.5
2.0
1.5
1.0
.5
Intertask
Interphrase
Intertask
Interphrase
Phrase Type